DATA PROCESSING DIGEST

1140 South Robertson Blvd. Los Angeles 35, California

a service of Canning, Sisson and Associates

© 1957

VOLUME 3 NUMBER 2
FEBRUARY, 1957

LIBRARY OF THE
MAR 11 1957
UNIVERSITY OF ILLINOIS

General Information

HELPING TO PUT ELECTRONIC EQUIPMENT TO WORK FOR BUSINESS

Paul W. Pinkerton, Haskins & Sells, New York
N.A.C.A. BULLETIN, January 1957; pages 626-634

Two of the outstanding impressions the author has received in his work on business applications of electronics are: 1) "electronics should not be used as a high-speed clerk," and 2) the use of electronic equipment will provide an even stronger tendency [than in the use of punch-card equipment] toward centralization of data processing..." (although "with good and cheap communications, there is no reason why a centralized data-processing system cannot serve decentralized management.")

CONTENTS

General Information 1
Equipment 8
Programming 9
Management Decision-Making Techniques 14
Comment 18
References 22
Training 23
Meetings 23

The author believes "that electronic equipment will find its greatest value in areas outside of accounting and routine record-keeping. In the manufacturing field, the areas of greatest potential appear to be in production scheduling and control, in stock control, and in engineering and research." He believes that "if the accountant is to continue to 'carry the ball' in data processing, he must widen his horizon to include the entire operation." Moreover, the accountant must realize that "accounting applications may well be in the last which should be considered" for inclusion in an EDP system.

Furthermore, "electronic equipment is going to prove its value to a greater extent where it is used to make automatic decisions than where it is used to produce more or quicker figures for human decision....Successful application of the cardinal exception principle requires that management go even further than it has in the establishment of quantitative criteria which can be translated into a program for making decisions not involving discretion."

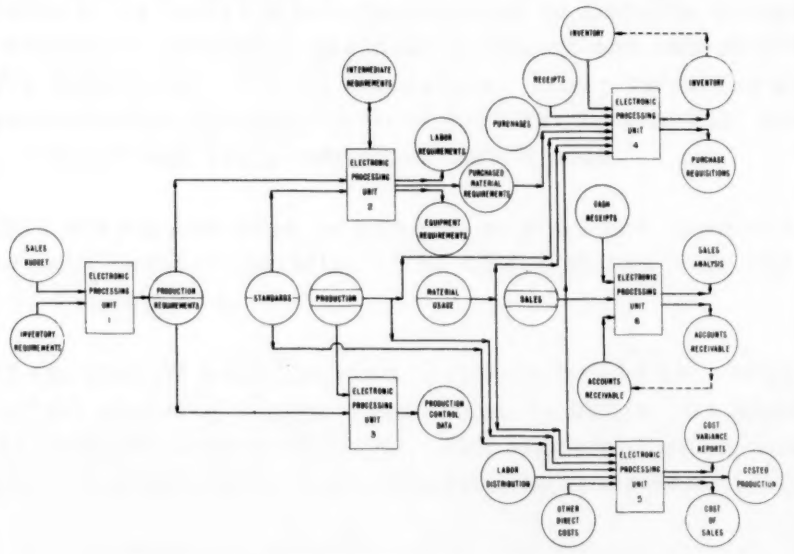
Although some persons have considered the invisibility of magnetic tape records as a disadvantage, the author believes "it is an advantage, in that it forces the planner to reconsider the

purpose of the records. If the visible record is made only to permit a human to reach a decision which can be reached automatically, is not the invisibility an advantage?...For reports needed by management for decision, electronic equipment will best serve if it produces answers rather than masses of undigested figures."

The remainder of the article is an illustration of the "interrelationship of data pertaining to widely separated functions and how they may be tied together by electronic processing." The example used is a chemical company which makes a variety of products in batches. The results may be finished products or intermediates which, in turn, are combined with other materials to make finished products. The basic principles in data processing are not greatly different from other types of operations.

EXHIBIT 1

COMBINED CHART OF SIX DATA PROCESSING OPERATIONS*



Note: The six charted indications of an electronic processing unit refer to the same machine.

"The chart in Exhibit 1 combines the charts for the six basic jobs which are shown on the other charts. To keep the charts from becoming too unwieldly, only two symbols are used. The rectangles represent the electronic data-processing machine (and this chart indicates six operations on one machine, not six machines). Each circle represents data recorded on magnetic tape--one or more reels of tape, depending on the volume. No printed reports are indicated, to avoid making the charts even more complex....It can be assumed that the system can type out or print selectively any information contained on any of the magnetic tapes. The aim might well be to print as little as possible!"

In Exhibit 2, information on the sales budget is combined with inventory requirements data to develop production requirements. "Going back upstream, the sales budgets are the result of processing data relating to general and specific market conditions and trends, marketing effort, and other factors, and inventory requirements are determined by considering such things as economic batch sizes, possible fluctuations in sales volume, the cost of carrying inventory,

EXHIBIT II

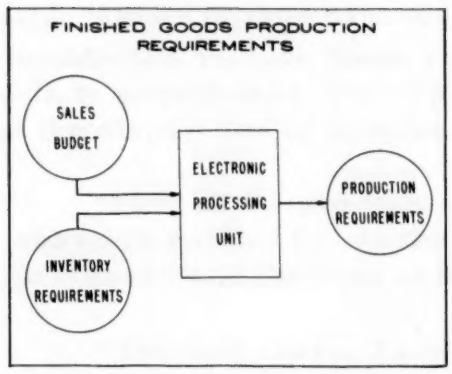
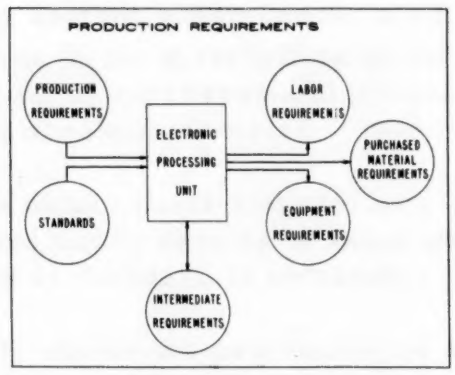


EXHIBIT III



and the length of the production cycle.... The related production requirements are translated into schedules in Exhibit 3 and compared with actual production for control purposes in Exhibit 4.

"The standards tape shown in Exhibit 3 would contain data as to each product, as well as information as to flexible budgets for each cost center." Included for each product and intermediate would be the following: bill of materials, labor requirements, power requirements, quality control test requirements, standard unit costs, equipment requirements, batch size.

"This standards tape is used to expand the production requirements into various details. The chart shows only the most important of the outputs...."

"At the end of each[period]reports would be prepared in required detail showing where production is behind or ahead of schedule as indicated by Exhibit 4. The information is obtained by matching the production requirements against actual production...."

EXHIBIT IV

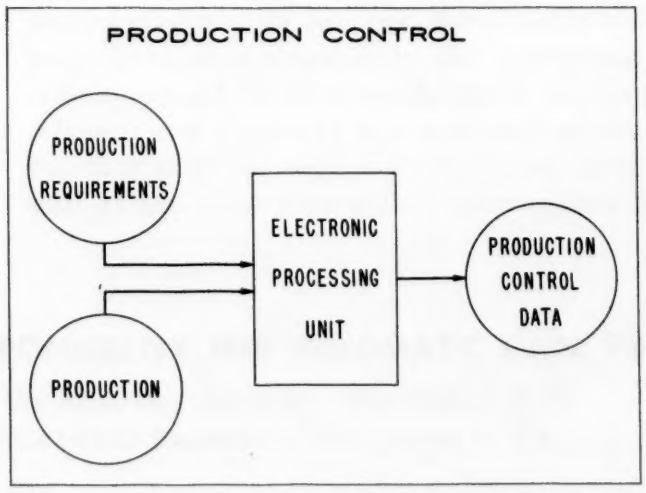
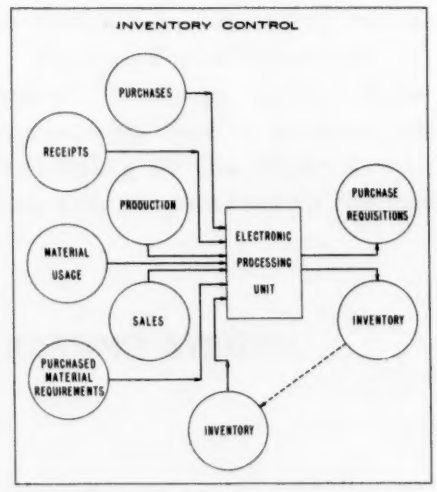


EXHIBIT V



"A typical inventory control job is pictured in Exhibit 5. The inventory of finished product, intermediates, materials, and supplies is updated by applying purchases, receipts, production, usage, and sales. The inventory records show details of material on order and committed for production or sales, as well as quantities on hand.... The introduction of the tape containing purchased material requirements, in conjunction with the other data, permits the automatic preparation of purchase requisitions. Or, if orders have been placed, releases to the vendors may be issued automat-

ically. Other phases of inventory control which can be handled automatically include those relating to the distribution of finished goods to warehouses, the expediting of purchases and production, and the disposition of surplus and obsolete material.

"Part of the processing to obtain costs and variance reports is shown in Exhibit 6. At the same time, data as to sales quantities is processed and the cost of sales at standard is obtained...."

"The last chart, Exhibit 7, shows the processing of sales data for two purposes: first, together with cash receipts, to update the accounts receivable, and second, for sales analysis."

EXHIBIT VI

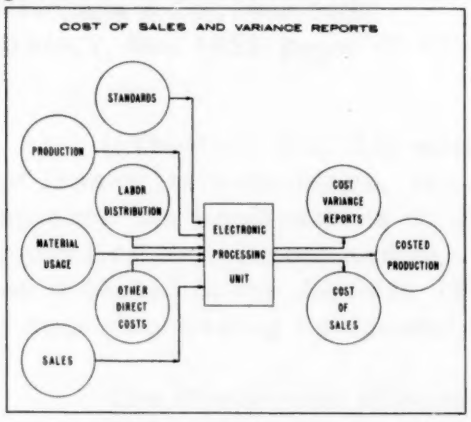
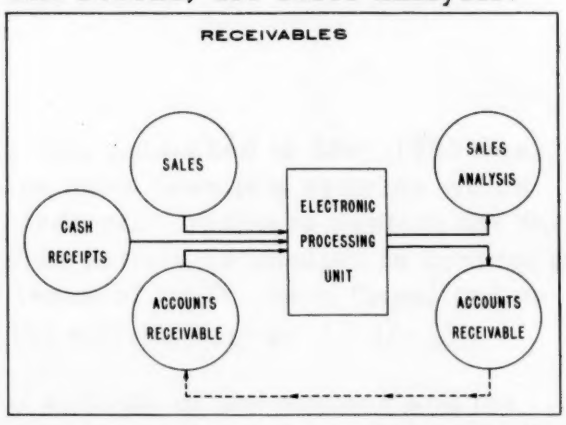


EXHIBIT VII



The article ends with these observations: "...when studying the possibilities of electronics, three more general observations would appear to be of interest to accountants. First, studies directed toward electronic systems have disclosed that there is much more paper work than was formerly believed to exist and a large part of the paperwork is in the factory. Second, preparing for electronic equipment is a task of considerable magnitude. It is primarily a task for insiders, who know the job to be done, not for outsiders who know only the machines. Third, the attitude of management is of considerable importance. Nothing can be done without the interest and support of management, but it is also important that management have an understanding of the objectives and of the probable effect on organization and on operating methods."

EXECUTIVE RESPONSIBILITY FOR AUTOMATIC DATA PROCESSING SYSTEMS

Lowell H. Hattery, The American University, Washington, D. C.
ADVANCED MANAGEMENT, December 1956; pages 11-14

Top management responsibility is necessary because there are "important differences in the problems of introducing electronic data processing systems which call for a higher degree of personal attention from top management, even to the point of keeping up with major hardware developments."

OFFICE EQUIPMENT

FORBES, January 1, 1957; pages 69-72

A run-down on the financial position of the top office-equipment manufacturers in the country includes IBM, Sperry Rand, National Cash Register, Burroughs, Royal McBee, Underwood, and Addressograph-Multigraph.

AUDITING, CONTROL, AND ELECTRONICS

A. B. Toan, Jr., Price Waterhouse & Co., New York
JOURNAL OF ACCOUNTANCY, May 1955; pages 40-45

((The fact that this article was published in May 1955 does not lessen its timeliness, for there have been few articles which explored the implications of the electronic business system for the controller or internal auditor. This article is similar in content to one digested in the January 1957 issue of DPD. See: "Application of data-processing equipment in the office," page 12.))

EDP requires new methods of internal control

The discussion of areas of activity of the auditor and the controller are limited in this article to "establishing that the original data are authentic and accurate; ascertaining that these data, and only these data, are recorded; and determining that the form of the record and the evidence supporting it will satisfy those who must attest to the integrity and accuracy of these records."

Accuracy depends, not only upon the manufacturer of the equipment, but also upon the methods designed by the auditor. He must insist that the computer group "provide checks within the programs themselves--to balance against predetermined... totals... or to recompute critical transactions." He will also provide for preventive maintenance and diagnostic checks, and require visual assurance, through flow charts, that the programs have provided for every exigency. It is not anticipated that more than ordinary precautions need be taken against unauthorized changing of data or programs by the computer group or the operator, as such a problem is not likely to be greater in electronics than in punch card operations.

It is anticipated that new techniques of control will need to be found and exercised over the origination of data in order to assure its accuracy when it is recorded in non-visual media such as magnetic tape. "It may be that... there will be attempts at by-product recording... at the same time and as the result of the same motion, by which a visible document is being prepared on a machine."

Other controls will need to be devised to assure that the data as accepted by the electronic system is accurate, and according to

the program laid out for it. In the area of output, certain records for control will probably need to be printed. These include: details or movement of an account balance, details of what comprises a total or net figure, reference to the original transaction, selective reports on deviations from established norms.

The tendency will be toward less division of duties, with more control exercised by fewer people aided by programmed controls in the computer system.

APPRAISING THE ECONOMICS OF ELECTRONIC COMPUTERS

Frank Wallace, Peat, Marwick, Mitchell & Co.
Published by Controllership Foundation, 1956

Practical manual on EDP

Although the general theme of the report follows the conventional and popular thinking of the past two or three years in investigating a company's potential for electronics, this concept is still in wide acceptance, and the principles are being adhered to with apparently satisfactory results by many companies. This is the "practical" approach which uses the computer for the immediate benefits derived from reduced clerical costs, with a plus-factor in providing better and more information for management control.

The report seems to have been designed as a manual, a quick view of the EDP field for the top executive who wants to begin NOW. There is implied in the tone of the report a suggestion that the entire concept of the business organization is due for a change, however the direct hand-book approach is not muddied unduly with philosophical material. The writing is crisp and clear, paragraphs are short and to the point. Following the eight chapters on organizing a study program and planning for a computer installation, is an appendix including a short description of computer operation, a sample payroll problem as it might be solved on a medium- and on a large-scale computer, a brief summary of medium- and large-scale computers available, and six pages on operations research.

Price: $4.00 ($3.20 to members of Controllers Institute)

MAN AND AUTOMATION

Report of Conference sponsored by the Society for Applied Anthropology
December 1955
Published by Yale University, 1956

This conference explored the implications of automation in its effect on man, both specifically in relation to job satisfaction and security, and in the broader sense of the effect on civilized

living and man's ultimate goals. While much of the factual information and description of automation techniques contained in the reports is well known to anyone interested in the field, the reports are given from the point of view of man's material and psychological needs. Since the purpose of business and industry is to maintain man's existence, such a report should have a place of top importance in the reading of those planning automated systems.

Some of the questions posed are: how does automation change the nature of jobs, how does the change affect the worker's satisfaction and sense of security, what kinds of jobs remain for those displaced by automated processes, does automation really up-grade jobs, and many other thought-provokers. Following sections on the effect of automation on office workers and factory workers, is a section which points up the need for research in such areas as the impact of automation on the economy and the social structure, the problem of automation "displacees," changing concepts of business organization, and retraining programs.

Price: $2.00

SUPPLEMENTING ELECTRONIC EQUIPMENT WITH A MODERN COMMUNICATIONS SYSTEM

Monroe M. Koontz, Inland Steel Company, East Chicago, Indiana
N.A.C.A. BULLETIN, January 1957; pages 613-625

Much of the advantage of high-speed electronic data processing is nullified by slow data transmission from source documents. The owner-manager of the small business enterprises of a century ago had the advantage of the almost negligible time elapse between the perception of a written or spoken order and the action taken on the order, because both of these operations took place within the brain of a single individual. No electronic system yet designed has been able to equal this timing and ability to judge instantaneously. However, there are many situations in modern business where, although geographic distance and organizational structure separate these two functions, perception and action can be made nearly instantaneous through the use of closed circuit television. Such installations are more economical than more cumbersome and time-consuming wire communications.

IS THIS A JOB FOR AUTOMATION?

BEST'S LIFE NEWS, December 1956; page 11

Many life insurance beneficiaries receive monthly income checks from more than one company, each of which probably processes them mechanically, and on different schedules. Thus, the

beneficiary is getting his or her income "piecemeal," which is a nuisance, and the companies are duplicating each other's efforts in the processing procedures. It is suggested that it might be practical for life insurance companies, once a policy becomes a claim, to turn over payment of any income proceeds to a central office. "Periodically the insurance companies concerned would transfer funds to the cooperative central office, which would mail one check monthly to the payee. Adjustments because of excess interest could be calculated by the individual companies as is done at present. Many subsidiary advantages would accrue. For example, the death of a beneficiary receiving income under an option involving a life contingency would immediately become known to all companies maintaining the central office....A central paying office could service many companies which might not be able, individually, to afford[large data processing machines]for some time to come.... For bigger companies in large cities where high cost space is a problem, the separation of this chore from other functions might be a highly welcome development."

Equipment

IBM 709 HIGH-SPEED "SCIENTIFIC" COMPUTER

IBM has announced the Model 709, apparently an improved version of the 704. A 709 system leases for about $56,000 or sells for $3,000,000. The 709 includes decimal-binary conversion instructions, new (Model 729) tape units which automatically check data while it is being written, and a memory of up to about 327,000 characters.

A new tape "buffer" unit called the Model 766 Data Synchronizer allows coupling from the computer to eight tape units, or to card readers, punches, magnetic drums, etc., apparently with facility for simultaneous reading and writing. Forty-eight tape units can be handled with three buffers. With three buffers, six input-output units can be operated simultaneously. All 709 tapes are compatible with other 700 series systems.

Programming

PROGRAM CONTROL TECHNIQUES

Mrs. Frances E. Holberton, David W. Taylor Model Basin, Washington, D. C.
THE PROGRAMMER, September 1956; pages 4-15

An outline of the description of a file maintenance problem for programming practice is given. ((Being an outline it is somewhat difficult to follow.)) The problem illustrates very clearly the many program controls necessary to insure that a computer program runs properly.

The following program controls are outlined:

A. Tape Labeling[1]

Programming requires attention to many details

1. Check input tape labels against expected label to safe guard against operator error in mounting tape on incorrect servo.
2. Output tape label written only if data will follow.
3. Preparation of output Printed label containing:
   a. Servo number and number of blocks.
   b. File label and sequence number.
   c. First item key on tape.
   d. Last item key on tape.

B. Multiple Input and Output Tapes

1. Two independent files processed simultaneously.
2. Partial elimination of unused tape time by use of standby storage block.
3. Two separate output files.

C. Alternation of Tapes

1. Provision for handling files of more than one tape length. ((i.e., several reels))

D. Reduction of Number of Servos Operated

1. Provision for running the problem even though as many as three servos are non-operative. The ability to revert back to the full complement of servos at the end of any output tape.

E. Ability to Alter the Normal Path of the Routine

1. The use of Conditional Breakpoint options to

perform special procedures.

a. Rerun
b. Servo elimination

F. Safe-Guarding against Machine Breakdown

1. Provision to rerun the problem from the beginning of any output tape from a memory dump stored on a separate servo.
2. Provision to re-make a single tape if the tape should break or be unreadable during future processing and the memory dump tape[2] not available. The memory is written at the end of all output tapes.
3. Prepare to rerun the problem from any previous memory dump by not destroying an early memory dump by a later memory dump.

G. Safe-Guarding against Operator Errors

1. Eliminate all unnecessary type-ins to computer.
2. Safe-guard against errors made in manual re-read of input tapes by counting input blocks and comparison against a stored counter on tape.
3. Notify the operator by Printer output when a tape is on the wrong servo and what tape is expected.
4. Print out on Printer following a conditional transfer Breakpoint option.
5. Print out on Printer "End of Run" when routine has been completed.

H. Aids for Problem Debugging

1. Ability to retain all register contents and write the memory on tape at the completion of any line of coding (provided the overflow flip flop is not set) by typing one word into the control register, which performs a programmed memory dump. To be used with the memory Breakpoint Dial System which permits the programmer to stop the computer on any line of coding.
2. Ability to automatically read back any memory dump from a series of memory dumps and reposition all tapes to continue from this part in the problem debugging.
3. Ability to rewind all tapes and stop automatically by a Clear C operation.

I. Supervisory Control Problem Log

1. The Supervisory Control Printer contains a log of the following information:
   a. Problem name.
   b. Number of servos operated on the line.
   c. Servo number and label of each input tape.

d. Servo number, block count, first and last item key on each output tape.
e. Indication of any incorrect tapes mounted.
f. Indication of any transfer Breakpoints forced.
g. Indication of wrong number of blocks read on input.
h. Indication of whether an output tape contains no information.
i. Indication of end of problem.

J. End of Tape and File Logic

1. Sentinel[3] search on input tape (once per block read).
2. Writing sentinels on output tapes only after determining whether an end of tape or end of file sentinel is required.
3. Handling of partial block on output.
4. Obtaining last item key for print out.
5. Positioning of sentinel in partially filled output block.

K. Miscellaneous Coding Techniques
1. Overflow control.
2. Item transfer and advancing items in the computer.
3. Variable connectors (altering the exit point of a subroutine).
4. Subroutines.

An example flow chart and code

The outline goes on to flow chart and code in part this file maintenance example. It is an excellent illustration of the detail required in programming. For example: the part of the program which makes the comparison of file records with change data to insure proper updating (not including updating, however), which handles the memory dump procedures and allows for tape units being out-of-commission, requires 73 blocks on the flow chart. Another part of the flow chart which checks for the proper tape label data and positions the tape properly for a rerun has 11 blocks and requires a code of 34 instructions.

The entire program would have over 1800 (single-address) instructions when completely coded.

((Notes:

1. A "tape label" is a block on the tape that tells what information is in the remaining blocks of tape.

2. As a checking procedure, periodically the contents of the entire memory are recorded on a tape, so that they can be called back into the memory to restart the program. This procedure is known as "dumping" the memory. Hence, the tape on which the contents of the memory are recorded is called the "memory dump tape."

3. A "sentinel" is "a symbol marking the beginning or end of some element of information such as a field, item, block, tape, etc.; a tag." In this case sentinels mark the end of tapes and of files. (Definition from Association for Computing Machinery's "First Glossary of Programming Terminology," obtainable for 25¢ from ACM, 2 East 63rd Street, New York 21, New York)))

INDEXING FOR RAPID RANDOM ACCESS MEMORY SYSTEMS

Arnold I. Dumfy
COMPUTERS AND AUTOMATION, December 1956; pages 6-9

The inherent quality of quick lookup of the random access memory needs to be implemented through programming techniques. In some applications (i.e., inventories which have a simple numerical part numbering system), the item description (e.g., stock number) may be used as the item's address. In other cases, the item description may be a mixture of numbers and alphabetic characters, or contain characters that are redundant or not significant for indexing purposes. In such cases, the programmer needs to devise indexing systems which will locate the desired information quickly, and which will not fill valuable storage space with information not contributing to the indexing function.

Five ways to reduce look-up time

In designing an indexing system the limitations are: number of locations in the memory, capacity of each location (digits), form of address (decimal, binary, etc.), number of items to store, and the size of each item. Also important in many cases are these factors: work-loads and time-available to process items, whether all information about an item must be stored, rate at which items are added and dropped, whether we can go to more than one location for an item, and the variations on size and nature of the items.

Some indexing methods are:

1. Put the items in order on the "tracks" (or other sub-units) of the memory. Search the center track first, if the address being sought is higher, say, than the highest on the center track, look next on the track half-way between the center and the top, and so on, until the proper track is found.

2. Set aside some tracks as "address" tracks. For each item or description number the address track will have associated with that description the corresponding location of the item in the memory. (Two look-ups are made, first on the address track and then in the storage tracks.)

Methods 1 and 2 tend to be time-consuming because several look-ups are required.

3. Sometimes a portion of the item description may be usable as the memory location address.

4. Sometimes a portion of the item description is usable as an address except that there will be duplicates (two items with the same address). In this case, "overflows," that is, duplicates, can be handled by separate processes. This is especially true if the overflows are averaged to be the inactive items.

5. By arithmetic manipulations of the item description number, a set of numbers can sometimes be obtained which are randomly distributed, within the number of location address numbers available, and will contain no duplicates; so that they can be used as addresses.

((The manuals on the 305 RAMAC and 650 RAM published by IBM also discuss indexing methods.))

PRINCIPLES OF PROGRAMMING

J. B. Ward, Purdue University
ELECTRICAL ENGINEERING, December 1956; pages 1078-1083

The process of programming a computer has been reduced to the simplest language and the simplest examples, using an imaginary single-address computer. Program charts are prepared from preliminary flow charts, including the branching operation and a brief mention of the use of sub-routines. This is an excellent article for persons who are curious about the elementary principles of programming, especially for those considering a career in programming, but lacking in a knowledge of computers.

Management Decision-making Techniques

MANAGEMENT SCIENCES IN SUPPORT OF A COMPUTER APPLICATION PROGRAM

Part I, Philip A. Toll; Part II, Bernard H. Stowens; Sperry Gyroscope Company
Papers delivered to The Institute of Management Sciences, October 1956; Los Angeles, California

PART I

A management science group should be a permanent part of the organization

A computer application program "should be related to the long-term growth and continued operation of the company undertaking it." If this approach is used, "then a strong theoretical base...must be provided to support the plan of attack on problems of business data handling throughout a company over a span of years." In fact, "it is really the theoretical foundation that management should 'buy,' not a computer or any other hardware." The raison d'etre for the computer application program should be fundamentally the same as for tool engineering or product design functions. This calls for the work of a group of management scientists, which would establish "the theoretical support for examining relationships between 1) what managers attempt to do in a business; 2) the techniques they do, or could, use in accomplishing their objectives; and 3) the information system needs related to the techniques to be used---with the intent that these investigations will permit application of data processing equipment in such a way that the level of effectiveness of company management will be appreciably raised."

Besides these functions, the management science group should conduct continuing research in computer application fields, management control, and the evaluation of the systems it puts into operation.

The author does not agree with the thesis that better management can be obtained merely through an increase in the accuracy and timeliness of the information management receives. Rather, "the best way to relieve problems of management at any particular level is to improve the facility with which control of operations is exercised at subsidiary levels. Beyond this, what is needed is an heirarchial information system for, first, indicating deviations from plan, and second, the importance of such deviations from the manager's viewpoint at each level." The attainment of this is a principal phase of the management science group's work.

Certain principles of organization, the author believes, are necessary for the best operation of the group. First, the data processing facilities should be centralized. The research group (i.e., the management science group discussed here) should report to the manager of the data processing center, and be on a par with the programming and operations groups. This group should work

closely with the programming group in preparing and evaluating data processing systems. Both a scholastic background in science and experience within the company are prerequisites for membership in the management science group, and the company experience of the group should include all the principal functions of the business.

The management science group needs to work with all existing line and staff organizations within the company, and should be able to cooperate with and win cooperation from all the departments. At times, the research group could "subcontract" a research project to the existing organization. Among the areas in which the existing organization can help the research group are: "the nature of the existing and former systems, the character of data available for analysis, data collection, data reduction and analysis, assistance in design of system and sub-system tests and the actual testing, analysis of test results, formulating and putting into effect plans for old-to-new system transitions, testing and evaluating results of new systems, and carrying out organization and other realignments consistent with the changed conditions prevailing after installation of a new system." To do this cooperating and subcontracting, the research group must provide detailed specifications for the projects to be undertaken by other departments. In addition, the supervisors of those departments must be educated in the nature and use of the computer system, and the objectives of the projects. It is of value to encourage the research people to discuss freely the plans, progress, and other matters related to the company's data processing program with those supervisors who are being asked for assistance or consultation. When outside consultants are used, the research group should be the company contact.

PART II

As an example of the use of a management science research group, Part II discusses A Model for Job Shop Scheduling, as a method for improving one area of manufacturing planning procedures.

In a job shop "manufacturing is initiated by receipt of a definitive order specifying the quantity to be produced and a promised delivery date. Consequently, the work load consists of a collection of individual jobs or lots rather than a more or less even flow of identical items."

Also, "it is usually organized as a 'colony shop'"...similar tools such as lathes, drills, milling machines, etc., are placed together in separate colonies or machine groups. A lot which requires several different operations...is physically moved (or 'routed') from one colony to another in the proper sequence."

Although a small job shop operation can be reasonably efficient, "as soon as the number of jobs and the number of diverse colonies becomes reasonably large, the interrelation between jobs and machines becomes so complex that it becomes almost impossible to visualize

future activities with any clarity. Consequently ... central planning and control... become more of an intuitive art than a rational procedure," even though "a great deal of data processing might be involved in obtaining the information on which final decisions are based."

While "an ideal solution to job shop problems would be to establish a procedure which would produce a complete shop schedule.... there are two primary reasons for abanding an attempt to do direct scheduling. First, in a reasonably large shop the sheer volume of information handling required is formidable...." Second, and "a more compelling factor... is the fact that even if an ideal schedule could be devised, it would be physically meaningless since the shop could not possibly live up to it[because of]unexpected and unpredictable occurrences which might make it impossible to perform a given job at a given time." Thus, "the operation of a job shop can be described as a stochastic process; i.e. a sequence of events which occur at random times." A stochastic mathematical model is then described as a possible solution to job shop control. "The accuracy of the model can be established by studying existing shop procedures without in any way interferring with the normal, vital operation of the business."

However, "setting up a good mathematical model is only the first step toward the final objective of achieving shop control. With such a model it should be possible to set up procedures for the following activities: a) determination of optimum shop loads; b) determination of best times to start new jobs; c) prediction of missed dates."

In developing such a mathematical model, its compatibility with the capabilities and capacities of the computer and data gathering system must be studied.

OPERATIONS RESEARCH FOR MANAGEMENT, VOLUME II

Joseph F. McCloskey and John M. Coppinger, editors
Published by Johns Hopkins Press, 1956

In Volume II, a continuation of the principles set forth in Volume I, the editors present a selected group of the papers given before The Johns Hopkins University Informal Seminar on Operations Research during 1953-54 and 1954-55. A partial list of the papers, listed under the three divisions in the book are:

Case histories:

Analysis of a Railroad Classification Yard
Queuing Theory and Cost Concepts Applied to a Problem in Inventory Control

Methods:

Design of Experiments in Operations Research
Failure of Complex Equipment
Operational Gaming in Industry
How is Planning Possible?

Case histories and examples of OR in use

Information Handling:

Information Handling in Organized Groups

While some military work has been included, the emphasis is on industrial operations research. An interesting introduction has been contributed by the Earl of Halsbury. In it, he pleads for a wider use of the scientific methods of operations research in considering the social problems of the world. Both the economist and the social scientist could find better solutions by making use of the available facilities of the electronic computer and the operational analyst.

This book is basic, along with Volume I, for the management science and operations research library. Price: $8.00

(Volume I, "Operations Research for Management," was listed in DPD September 1955, page 12.)

Comment

A selected list for beginning study of EDP

Here is a reading list selected from books and articles reviewed in DATA PROCESSING DIGEST during the past two years. The publishers of DPD have selected this basic list for persons who wish to begin the study of EDP systems, or who wish to review what they have learned over a long period of time. There are undoubtedly many excellent choices which do not appear on this list. It is difficult to sift the abundance of good material to a small, usable sampling. However, we believe that these selections will provide an excellent basic understanding of the electronic data processing field for anyone interested in pursuing a personal program of study.

We have attempted to arrange the titles in some order, progressing from general to more detailed material in most of the sections. The numerals following each selection indicate the volume, month, and page in DATA PROCESSING DIGEST in which the selection is reviewed. Addresses of publishers are given below to help you obtain copies of the selections listed.

READING LIST

A. General Information--Introductions to Data Processing Concepts

1. Workshop for Management
   Proceedings of SPA, Published by Management Magazines, Inc. 1955. I-9-2

2. Workshop for Management
   Proceedings of SPA, Published by Management Magazines, Inc. 1956. II-6-8

3. Office Work and Automation
   Howard S. Levin, John Wiley & Sons, 1956. II-6-4

4. Electronic Data Processing for Business and Industry
   Richard G. Canning, John Wiley & Sons, 1955. II-4-7

---

5. An Introduction to Automatic Computers
   Ned Chapin, Published by the author, 1955. I-12-8

6. The Responsibilities of Management by Electronics
   General E. W. Rawlings
   Armed Forces Management, July 56, pp 5-8. II-9-1

7. Electronic Data Processing in Industry
   American Management Association, 1955. I-9-7

8. Business Systems Can Be Engineered
   Roger L. Sisson; Automation, Dec. 55, pp 54-61. II-2-4

9. An Engineer s Approach to Office Systems
   Douglass A. Young. "Controlling Office Production,"
   AMA Office Management Series #140, 1955. II-2-11

10. Data Processing by Electronics
    Haskins & Sells, 1955. I-9-5

11. The Scope for Electronic Computers in the Office
    Office Management Association, England, 1955. I-12-10

B. Descriptions of Available Equipment

1. Office Automation: Integrated and Electronic Data Processing
   R. Hunt Brown
   Automation Consultants, Inc. 1955 and contin. I-11-7

(See also Section A, Items 7 and 10)

C. Descriptions of Applications

1. Programming for Electronics--a "Man-Sized Job"
   W. E. Eggleston, American Gas Association. II-3-10

2. A Case Study in Planning: Port of New York Authority
   Herbert F. Klingman, Controllership Foundation, 1956. II-7-2

3. Pioneering in Electronic Data Processing--Report No. 9
   American Management Association 1956. II-10-4

4. Automation of Bank Operating Procedure
   American Bankers Association, 1955. I-4-2

5. The Introduction of An Electronic Computer in a Large
   Insurance Company
   Studies of Automatic Technology No. 2, Bureau of Labor
   Statistics, U. S. Dept. of Labor. II-6-1

(See also Section A, Items 2 and 7)

D. Programming

1. Programming for Business Computers--a home study course
   Business Electronics Inc. II-8-16

(See also Section A, Item 4 for brief description of programming)

E. Discussions of Management Decision-Making Methods (Operations Research)

1. Operations Research for Management
   McCloskey and Treflethen
   Johns Hopkins Press Vol. I, 1954; Vol. II, 1956. I-9-12 and II-2-18
2. Decision-Making in the Age of Automation
   Melvin L. Hurni
   Harvard Business Review, Sept.-Oct. 55, pp 49-58. I-11-1

3. An Appreciation of Systems Analysis
   Charles Hitch
   Operations Research: Journal of ORSA, Nov. 55, pp 466-481
   II-3-12

4. Guides to Inventory Policy
   John F. Magee
   Harvard Business Review, Jan.-June 56. II-7-3

5. Multiple Factor Break-Even Analyses: The Application of Operations Research Techniques to a Basic Problem of Management Planning and Control
   Robert S. Weinberg
   Operations Research, the Journal of ORSA, Apr. 56, pp 152-186
   II-7-10

F. Discussion of the Data-Processing Equipment Industry

1. The Electronic Data Processing Industry
   Arthur D. Little, Inc.; White, Weld & Co. 1956. II-8-4

ADDRESSES OF PUBLISHERS OF MATERIAL IN SELECTED READING LIST

American Bankers Association
12 East 36th Street
New York 16, New York

American Gas Association Monthly
420 Lexington Avenue
New York 17, New York

American Management Association
1515 Broadway, Times Square
New York 36, New York

Armed Forces Management
208 South Second Street
Rockford, Illinois

Automation
Penton Building
Cleveland 13, Ohio

Automation Consultants, Inc.
1450 Broadway
New York 18, New York

Business Electronics, Inc.
P.O. Box 3330, Rincon Annex
San Francisco 19, California

Ned Chapin
Stanford Research Institute
Menlo Park, California

Controllership Foundation, Inc.
Two Park Avenue
New York 16, New York

Harvard Business Review
Soldiers Field Station
Boston 63, Massachusetts

Haskins and Sells
67 Broad Street
New York 4, New York

Johns Hopkins Press
Johns Hopkins University
Baltimore, Maryland

Management Publishing Company
22 West Putnam Avenue
Greenwich, Connecticut

Office Management Association
58 Victoria Street
London S. W. 1, England

Operations Research, Journal of ORSA
Mount Royal & Guilford Avenues
Baltimore 2, Maryland

Bureau of Labor Statistics
U. S. Department of Labor
Washington 25, D. C.

White, Weld & Co.
40 Wall Street
New York 5, New York

John Wiley & Sons, Inc.
440-4th Avenue
New York 16, New York

A new film "Integrated Data Processing" has been produced by the National Office Management Association. The 16 mm color sound film runs 35 minutes, and shows the IDP equipment of 14 companies. Price: $400 each. Quantity prices and discounts to NOMA members and educational institutions are also available.

References

The addresses of publishers and periodicals mentioned in this issue of Data Processing Digest are listed below for your convenience in obtaining further information about the articles or books listed.

Advanced Management
74 Fifth Avenue
New York 11, New York

Automatic Control
430 Park Avenue
New York 22, New York

Best's Life News
75 Fulton Street
New York 38, New York

Computers and Automation
815 Washington Street
Newtonville 60, Massachusetts

Controllership Foundation Inc.
Two Park Avenue
New York 16, New York

Electrical Engineering
33 West 39th Street
New York 18, New York

Forbes
80 Fifth Avenue
New York 11, New York

Johns Hopkins Press
Johns Hopkins University
Baltimore, Maryland

Journal of Accountancy
270 Madison Avenue
New York 16, New York

Journal of Machine Accounting
53 West Jackson Boulevard
Chicago 4, Illinois

N. A. C. A. Bulletin
505 Park Avenue
New York 22, New York

The Programmer
Computer Publications Dept.
Remington Rand Univac
315 Fourth Avenue
New York 10, New York

Yale University
Institute of Human Relations
333 Cedar Street
New Haven 11, Connecticut

See DPD September 1956 for list of more than seventy periodicals regularly reviewed for significant information in the data processing and related fields.

DATA PROCESSING DIGEST is published each month by Canning, Sisson and Associates, 1140 South Robertson Boulevard, Los Angeles 35, California. Subscription rate: $24.00 per year. Foreign postage (exclusive of Canada and Mexico): $1.00 additional. Single copies: $3.00 when available. Editor: Margaret Milligan.

Training

Electronic Data Processing for Business and Industry
- Date: February 25 through March 1, 1957
- Place: Chicago, Sheraton-Blackstone Hotel (sponsored by Canning, Sisson and Associates and Data Processing Counselors)
- Program: Emphasis on the applications aspect of electronic data processing
- For whom: Controllers, Methods and Procedures Supervisors, others in management charged with setting up an EDP system
- Fee: $125 (payable to Data Processing Counselors)
- Information: Data Processing Counselors, 130 E. 59th St., New York 22, N.Y.

Seminars in operations research presented by Operations Research Institute
- Date: One seminar each month through June, 1957
- Subjects: Inventory and production management, Linear programming, Forecasting and budgeting
- Information: Operations Research Institute, Inc., 41 Fifth Avenue, New York 3, New York

Meetings

Third Annual Electronics Conference, sponsored by AMA
- Date: February 25-27, 1957
- Place: New York City (Statler Hotel)
- For whom: Management personnel
- Information: American Management Association, 1515 Broadway, Times Square, New York 36, N. Y.

Western Joint Computer Conference*
- Date: February 26-28, 1957
- Place: Los Angeles, California (Statler Hotel)
- Theme: "Techniques for Reliability"
- Information: S. D. Wanlass, Systems Research Corp., 13729 Victory Blvd., Van Nuys, California

First Transportation Research Symposium sponsored by TIMS, ORSA, AIIE
- Date: February 27, 28, 1957
- Place: Purdue University, Lafayette, Indiana
- Fee: $75.00
- Information: O. W. Davis, Adult Education, Agricultural Hall Annex, Purdue University, Lafayette, Indiana

Third Annual High Speed Computer Conference
- Date: March 5-8, 1957
- Place: Baton Rouge, Louisiana
- Information: Dr. Leon Megginson, College of Commerce, Louisiana State University, Baton Rouge, Louisiana

Workshop in EDP, sponsored by AMA

Date: First part, March 4-6; second part, April 15-17
Place: New York City (Sheraton-Astor Hotel)
Fee: $250 (AMA members) $300 (non members)
Information: American Management Association, 1515 Broadway, Times Square, New York 36, New York

Symposium on Systems for Information Retrieval, sponsored by The School of Library Science of Western Reserve University and the Council on Documentation Research

Date: April 15-17, 1957
Place: Western Reserve University, Cleveland, Ohio
Content: Information systems devised or adapted to meet specific problems
Information: Jesse H. Shera, Dean, School of Library Science, Western Reserve University, Cleveland 6, Ohio

Fifth Annual Meeting, Operations Research Society

Date: May 9, 10, 1957
Place: Philadelphia (Penn Sherwood Hotel and University of Pennsylvania)

Orientation Seminars on EDP and IDP, sponsored by AMA

Date: May 13-15, June 17-19
Place: New York City (Sheraton-Astor Hotel)
Fee: $150 (AMA members) $175 (non members)
Information: 1515 Broadway, Times Square, New York 36, N. Y.

International Conference and Exposition sponsored by NOMA.

Date: May 12-16, 1957
Place: Los Angeles, California
Information: National Office Management Association, 132 West Chelten Avenue, Philadelphia 44, Pa.

International Conference on Operational Research, sponsored by Operational Research Society, Operations Research Society of America, The Institute of Management Sciences.

Date: September 2-6, 1957
Place: University of Oxford, England
Subjects: The common themes in operational research, methodology, applications

*On Friday, March 1, 1957, following the WJCC, the Los Angeles Chapter of the ACM will hold a symposium entitled "New Computers--A Report from the Manufacturers." No registration fee is required. The symposium will be held in the Golden State Room at the Statler Hotel. It is designed to present an opportunity for the manufacturers to discuss the technical details of new computer systems. The program is restricted to general-purpose, large-scale systems for scientific and business applications. Only the newest equipment will be discussed. Companies and equipment represented are: NCR 304, ElectroData's Cardatron and Datafile, DATAmatic 1000, RCA BIZMAC II, UNIVAC Scientific Computer Systems, IBM STRETCH Computer, Philco S-2000, Logistics Research 800. For further information about the symposium, write to: Walter F. Bauer, Computer Systems Division, Ramo-Wooldridge Corporation, P.O. Box 45067 Airport Station, Los Angeles 45, California.